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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/532,775	03/22/2000	Takashi Kano	000352	8757

23850 7590 07/19/2002

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EXAMINER

NGUYEN, TUAN M

ART UNIT	PAPER NUMBER
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2828

DATE MAILED: 07/19/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/532,775

Applicant(s)

KANO ET AL.

Examiner

Tuan M Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on 22 March 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

  
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## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### *Drawings*

1. The drawing (figs 1-12) is objected for minor informaty. The boxes show in figures 1-12 are not labeled as required by 37 CFR 1.83(a). Applicant is required to submit a drawing correction for approval as require by rule 37 CFR 1.123

### *Claim Rejections - 35 USC § 112*

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites a semiconductor laser device with only the recitation of a plurality of layers, without the recitation of any laser layer structure which fails to render the structure of a laser.

Claim 2 recites "said at least one first layer" and "said at least one second layer" . There is no clear antecedent bases recited in claim1 to support the at least one first/second layer.

Claim 3 recites the structure of said nitride base semiconductor layer and said second nitride base semiconductor layer. However, the first and second nitride based semiconductor layers are not connected in the same order as show in figure 1.

Claims 4-20 fail to clearly recite the laser layer structure as shown in figure 1. the claims fail to clearly define the laser layer structure which render the claims confusing, vague, and indefinite.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

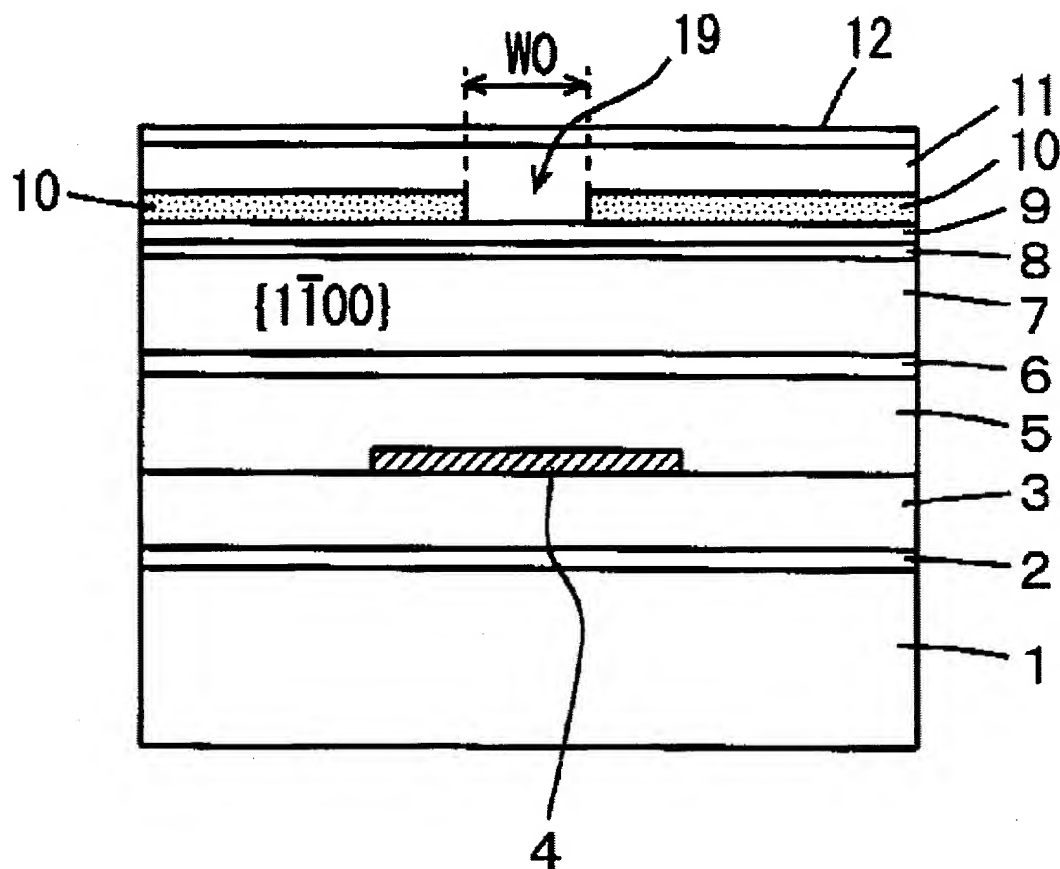
A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1- 4, 6, 9-11, 15-16 are rejected under 35 U.S.C. 102(a) as being anticipated by Hayashi et al (US patent 6,319,742 B1).

With respect to claim 1, Hayashi et al discloses a method of forming nitride based semiconductor layer comprises a sapphire substrate (1), an AlGa<sub>N</sub> buffer layer (2), undoped Ga<sub>N</sub> layer (3), SiO<sub>2</sub> film (4), n-Ga<sub>N</sub> layer (5), n-InAlGa<sub>N</sub> crack preventing (6), n-AlGa<sub>N</sub> gladding (7), multi quantum well active layer (8), p-AlGa<sub>N</sub> cladding layer (9), current blocking layer (10), p-AlGa<sub>N</sub> cladding layer (11), p-Ga<sub>N</sub> contact layer (12), current injection region (19), and striped region having a width WO, note cols. 3-12, see fig 1.

F I G. 1



With respect to claims 2 and 10, Hayashi et al discussed about the first layer has a larger aluminum composition ratio than the second layer, note cols. 3-12, see figs 1-13.

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With respect to claim 3, Hayashi et al shows the nitride based semiconductor layer includes a first cladding (7n), an active layer (8), and a second conductivity type first cladding layer (11), see fig. 1.

With respect to claim 4, Hayashi et al discussed about the first and second layers are alternately stacked, note cols. 3-10.

With respect to claim 6, Hayashi et al discussed about the thickness of the first layer and second layer, note cols. 10-12, se figs. 1-6

With respect to claim 9, Hayashi et al discussed about the active layer (8), first cladding layer (7), and second cladding (9, 11), note cols. 10-16, see figs. 1-6.

With respect to claims 11 and 15-16, Hayashi et al discussed about the active layer includes at least one quantum well layer containing indium, gallium and nitrogen (8), note cols. 3-12, see fig 1-6.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.

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3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 5 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi et al (US patent 6,319,742 B1).

With respect to claim 5, Hayashi discussed all above refractive index. However Hayashi did not compared the refractive index of the current blocking layer and the refractive index of the striped opening. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the refractive index, since it has been held that discovering an optimum value of a result effect variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

With respect to claims 18 -20, Hayashi discussed all above except for the third nitride based semiconductor layer and third cladding layer, note cols. 3-17, see fig 1-13. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the first and second nitride based semiconductor layers and first and second cladding layers , since it has been held that discovering an optimum value of a result effect variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

7. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi et al (US patent 6,319,742 B1) in view of Tsujimura et al (US patent 6,265,287 B1).

With respect to claim 17, Hayashi et al discussed all above except for the conductivity type light guide layer. Whereas Tsujimura discussed about the light guide layer, note col. 10, see fig 2. For the benefit of the light guide layer, it would have been obvious to one having ordinary

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skill in the art at the time the invention was made to provide Hayashi with the light guide layer as taught or suggested by Tsujimura.

8. Claims 7-8 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi et al (US patent 6,319,742 B1) in view of Shakuda (US patent 6,087,681).

With respect to claims 7-8 , 12-14, Hayashi et al discussed all above except for the band gap of current blocking layer is larger than band gap of second cladding layer and quantum barrier layers. Whereas Shakuda discussed about the band gap of current blocking and band gap of cladding layer and the quantum barrier layer, note cols. 13-18. For the benefit of the band gap, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide Hayashi with the band gap as taught or suggested by Shakuda.

#### *Citation Of The Pertinent References*

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclose.

The patent to Fujimoto et al (US patent 6242761 B1) discloses nitride compound semiconductor light emitting device.

The patent to Sugawara et al (US patent 6359292 B1) discloses semiconductor light emitting element.

The patent to Onomura et al (US patent 6185238 B1) discloses nitride compound semiconductor laser and its manufacturing method.

The patent to Kawai (US patent 6111273) discloses semiconductor device and its manufacturing method.

The patent to Okazaki et al (US patent 5966396) discloses gallium nitride based compound semiconductor laser and method of manufacturing the same.



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***Communication Information***

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan M Nguyen whose telephone number is (703) 306-0247. The examiner can normally be reached on 8am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on (703) 308-3098. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 306-5511 for regular communications and (703) 306-5511 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-3329.



Paul Ip  
SPE  
Art unit 2828

TMN  
July 10, 2002